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10/079,458	02/20/2002	William Frank Micka	TUC920010091US1 (14914)	6646
46263 7590 11/12/2008 SCULLY, SCOTT, MURPHY, & PRESSER, P.C. 400 GARDEN CITY PLAZA SUITE 300 GARDEN CITY, NY 11530			EXAMINER CHOJNACKI, MELLISSA M	
			ART UNIT 2164	PAPER NUMBER
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**Please find below and/or attached an Office communication concerning this application or proceeding.**

The time period for reply, if any, is set in the attached communication.

<b>Office Action Summary</b>	<b>Application No.</b> 10/079,458	<b>Applicant(s)</b> MICKA, WILLIAM FRANK	
	<b>Examiner</b> MELLISSA M. CHOJNACKI	<b>Art Unit</b> 2164	

**-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --**

**Period for Reply**

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

**Status**

- 1) ☒ Responsive to communication(s) filed on 02 July 2008.
- 2a) ☒ This action is **FINAL**.                      2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

**Disposition of Claims**

- 4) ☒ Claim(s) 1-11, 13-28, 30-34, 36-46 and 48-58 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1-11, 13-28, 30-34, 36-46 and 48-58 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

**Application Papers**

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on \_\_\_\_\_ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

**Priority under 35 U.S.C. § 119**

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All    b) ☐ Some \*    c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

**Attachment(s)**

- |  |   |
|--|---|
| 1) <input type="checkbox"/> Notice of References Cited (PTO-892)                     | 4) <input type="checkbox"/> Interview Summary (PTO-413)           |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | Paper No(s)/Mail Date. _____                                      |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08)          | 5) <input type="checkbox"/> Notice of Informal Patent Application |
| Paper No(s)/Mail Date _____  | 6) <input type="checkbox"/> Other: _____                          |

## DETAILED ACTION

### *Remarks*

1. In response to communications filed on July 2, 2008, claims 1, 18, 36 and 56 have been amended, no new claims have been cancelled, and new claim 58 has been added. Therefore claims 1-11, 3-28, 30-34, 36-46 and 48-58 are presently pending in the application.

### ***Claim Rejections - 35 USC § 103***

2. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

3. Claims 1-11, 13-16, 18-28, 30-33, 36-46, 48-51, 53-56 and 58 are rejected under 35 U.S.C. 103(a) as being unpatentable over Milillo et al. (U.S. Patent No. 6,643,671) in view of Beal et al. (U.S. Patent No. 6,253,295) [As disclosed in applicants "Information Disclosure Statement" filed 2/20/2002].

As to claim 1, Milillo et al. teaches

(a) destaging modified data to a first volume at the primary site for a current database update and updating one or more bits in a first bitmap at the primary site that indicate one or more tracks on the first volume that are to be

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overwritten with the modified data, the updating one or more bits being a first point in time virtual copy of the modified data of the first volume to a second volume, wherein the first point in time virtual copy updates the first bitmap without copying the modified data to the second (See column 2, lines 44-67; column 3, lines 1-33; column 8, lines 13-67; column 9, lines 1-5);

(b) transferring the first bitmap to a second bitmap at the primary site for indicating the modified data that is to be transmitted to a third volume at the remote site for the current database update (See column 4, lines 47-60; column 8, lines 42-60); and

(c) synchronizing the second volume with the third volume at the remote site for the current database update by transmitting the modified data from either the first or the second volume depending on the bit setting in the first bitmap, to the third volume as indicated by the one or more bits in the second bitmap (See column 2, lines 43-67; column 4, lines 47-60).

Milillo et al. does not teach a method for asynchronously transmitting one or more incremental database updates from a primary site to a remote site, the primary site and the remote site interconnected by at least one communication link; and performing a second point in time virtual copy of the modified data of the third volume to a fourth volume, which is at the remote site.

Beal et al. teaches a system and method for enabling pair-pair remote copy storage volumes to mirror data in another pair of storage volumes (See abstract), in which he teaches a method for asynchronously transmitting one or more incremental database updates from a primary site to a remote site, the

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primary site and the remote site interconnected by at least one communication link (See abstract, column 2, lines 53-67; column 3, lines 1-14); and performing a second point in time virtual copy of the modified data of the third volume to a fourth volume, which is at the remote site (See abstract; column 3, lines 27-33).

Therefore, it would have been obvious to a person having ordinary skill in the art at the time of the invention was made to have modified Milillo et al., to include a method for synchronously transmitting one or more incremental database updates from a primary site to a remote site, the primary site and the remote site interconnected by at least one communication link; and performing a second point in time virtual copy of the modified data of the third volume to a fourth volume, which is at the remote site.

It would have been obvious to a person having ordinary skill in the art at the time the invention was made to have modified Milillo et al., by the teachings of Beal et al. because a method for synchronously transmitting one or more incremental database updates from a primary site to a remote site, the primary site and the remote site interconnected by at least one communication link; and performing a second point in time virtual copy of the modified data of the third volume to a fourth volume, which is at the remote site would provide an improved method and apparatus for transferring copies of directories of a PPRC virtual volume pair to a second pair of co-located virtual volumes (See Beal et al., column 3, lines 5-8).

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As to claims 2, 19 and 37, Milillo et al. as modified, teaches wherein the first bitmap represents a FlashCopy bitmap and the second bitmap represents a peer-to-peer remote copy (PPRC) bitmap (See Milillo et al., column 1, lines 13-20; column 2, lines 44-50, where “FlashCopy” is read on “snapshot”).

As to claims 3, 20 and 38, Milillo et al. as modified, teaches wherein the first point in time virtual copy is achieved by flashcopying the modified data of the first volume to the second volume (See Milillo et al., column 2, lines 44-50; column 3, lines 21-30; column 7, lines 66-67; column 8, lines 1-9; column 9, lines 24-34).

As to claims 4, 21 and 39, Milillo et al. as modified, teaches wherein the step of flashcopying initializes the one or more bits in the first bitmap (See Milillo et al., column 2, lines 44-53, where “flashcopying” is read on “snapshot copy”; column 4, lines 47-60).

As to claims 5, 22 and 40, Milillo et al. as modified, teaches wherein the second point in time virtual copy is archived by flashcopying the modified data of the third volume at the fourth volume (See Milillo et al., column 2, lines 44-53, where “flashcopying” is read on “snapshot copy”; column 4, lines 47-60; column 8, lines 29-60).

As to claims 6, 23 and 41, Milillo et al. as modified, teaches further comprising providing an application host that is associated with the first volume for performing the one or more incremental database updates (See Beal et al., abstract; column 3, lines 27-33; also see Milillo et al., column 1, lines 56-67; column 2, lines 1-6); further comprising an application host that is associated with the first volume for performing the one or more incremental database updates (See Beal et al., abstract; column 3, lines 27-33; also see Milillo et al., column 1, lines 56-67; column 2, lines 1-6).

As to claims 7, 24 and 42, Milillo et al. as modified, teaches further comprising a staggering the one or more incremental database updates during

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the current database update (See Beal et al., abstract; column 3, lines 27-33; also see Milillo et al., column 9, lines 24-47); further comprising a means for staggering the one or more incremental database updates during the current database update (See Beal et al., abstract; column 3, lines 27-33; also see Milillo et al., column 9, lines 24-47).

As to claims 8, 25 and 43, Milillo et al. as modified, teaches wherein staggering comprises:

determining whether a synchronization for a previous database update is complete after the destaging is preformed for the current database update (See Beal et al., abstract; column 3, lines 27-33); and waiting for the synchronization of the previous database update to complete before the performing the first point in time virtual copy for the current database update (See Beal et al., abstract; column 3, lines 27-33; also see Milillo et al., column 1, lines 56-67; column 2, lines 1-6); wherein the means for staggering determines whether a synchronization for a previous database update is complete after the destaging is performed for the current database update (See Beal et al., abstract; column 3, lines 27-33); and waits for the synchronization of the previous database update to complete before the transferring of the first bitmap to the second bitmap for the current database update (See Beal et al., abstract; column 3, lines 27-33; also see Milillo et al., column 1, lines 56-67; column 2, lines 1-6).



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As to claims 9, 26 and 44, Milillo et al. as modified, teaches initializing the first bitmap for a next database update after the performing the first point in time virtual copy for the current database update (See Milillo et al., column 2, lines 44-53; column 4, lines 47-60; column 8, lines 42-60, where “flashcopying” is read on “snapshot copying”); and waiting for the next database update after the synchronizing for the current database update (See Beal et al., abstract; column 3, lines 27-33); wherein the means for staggering initializes the first bitmap for a next database update after the first means performs the point in time virtual copy for the current database update (See Milillo et al., column 2, lines 44-53; column 4, lines 47-60; column 8, lines 42-60, where “flashcopying” is read on “snapshot copying”); and waits for the next database update after the means for synchronizing synchronizes the second volume with the third volume for the current database update (See Beal et al., abstract; column 3, lines 27-33).

As to claims 10, 27 and 45, Milillo et al. as modified, teaches wherein the synchronizing is achieved by establishing a peer to peer remote copy session between the second volume and the third volume for physically transmitting the modified data of the second volume over the at least one communication link to the third volume (See Beal et al., abstract; column 3, lines 27-33; also see Milillo et al., column 1, lines 35-48, lines 56-67; column 2, lines 1-6); wherein the means for synchronizing establishes a peer to peer remote copy session between the second volume and the third volume for physically transmitting the modified data of the second volume over the at least one communication link to the third

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volume (See Beal et al., abstract; column 3, lines 27-33; also see Milillo et al., column 1, lines 35-48, lines 56-67; column 2, lines 1-6).

As to claims 11, 28 and 46, Milillo et al. as modified, teaches further comprising a providing a controller at the primary site for managing access to both the first volume and the second volume (See Beal et al., abstract; column 3, lines 27-33; also see Milillo et al., column 3, lines 35-49; column 6, lines 53-67); and providing a controller at the remote site for managing access to the third volume and the fourth volume (See Beal et al., abstract; column 3, lines 27-33; also see Milillo et al., column 3, lines 35-49; column 6, lines 53-67); further comprising means for managing access to both the first volume and the second volume (See Beal et al., abstract; column 3, lines 27-33; also see Milillo et al., column 3, lines 35-49; column 6, lines 53-67); and means for managing access to the third volume and the forth volume (See Beal et al., abstract; column 3, lines 27-33; also see Milillo et al., column 3, lines 35-49; column 6, lines 53-67).

As to claims 13, 30 and 48, Milillo et al. as modified, initializing the first bitmap to indicate that all data on the first volume is to be copied to the second volume and all data that is copied to the second volume is to be copied to the third volume (See Milillo et al., column 2, lines 44-53, lines 58-63; column 4, lines 47-60; column 8, lines 42-60); means for initializing the first bitmap to indicate that all data of the first volume is to be copied to the second volume and all data that is copied to the second volume is to be copied to the third volume (See

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Milillo et al., column 2, lines 44-53, lines 58-63; column 4, lines 47-60; column 8, lines 42-60);

As to claims 14, 31 and 49, Milillo et al. as modified, teaches further comprising providing a recovery host that is associated with the forth volume for recovering from a failure of the primary site by providing access to the forth volume (See Milillo et al., column 8, lines 42-67, where “recovery host” is read on “recovery operation”; column 10, lines 38-54).

As to claims 15, 32 and 50, Milillo et al. as modified, teaches further comprising automatically initiating the incremental database updates (See Milillo et al., column 15, lines 20-23); the system further comprising a means for automatically initiating the incremental database updates (See Milillo et al., column 15, lines 20-23).

As to claims 16, 33 and 51, Milillo et al. as modified, inspecting the one or more bits of the first bitmap at the primary site to determine whether the second volume includes data of the one or more tracks on the first volume that are to be overwritten with the modified data (See Milillo et al., column 2, lines 44-53, lines 58-67); and performing a point in time virtual copy from the first volume to the second volume of the data of the one or more tracks on the first volume that are to be overwritten with the modified data if the first bitmap indicates that the second volume does not include the data of the one or more tracks on the first

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volume that are to be overwritten with the modified data (See Milillo et al., column 2, lines 44-53; column 4, lines 47-60); means for inspecting the one or more bits of the first bitmap at the primary site to determine whether the second volume includes data of the one or more tracks on the first volume that are to be overwritten with the modified data (See Milillo et al., column 2, lines 44-53, lines 58-67); and means for performing a point in time virtual copy from the first volume to the second volume of the data of the one or more tracks on the first volume that are to be overwritten with the modified data if the first bitmap indicates that the second volume does not include the data of the one or more tracks on the first volume that are to be overwritten with the modified data (See Milillo et al., column 2, lines 44-53; column 4, lines 47-60).

As to claim 18, Milillo et al. teaches a means for destaging modified data to a first volume at the primary site for a current database update and updating one or more bits in a first bitmap at the primary site that indicate one or more tracks on the first volume that are to be overwritten with the modified data, the updating one or more bits being a first point in time virtual copy of the modified data of the first volume to a second volume, wherein the first point in time virtual copy updates the first bitmap without copying the modified data to the second (See column 2, lines 44-67; column 3, lines 1-33; column 8, lines 13-67; column 9, lines 1-5);

first means for transferring the first bitmap to a second bitmap at the primary site for indicating the modified data that is to be transmitted to a third

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volume which is at the remote site for the current database update (See column 4, lines 47-60; column 8, lines 42-60); and

means for synchronizing the second volume with the third volume for the current database update by transmitting the modified data of the second volume to the third volume as indicated by the one or more bits in the second bitmap (See column 2, lines 43-67; column 4, lines 47-60).

Milillo et al. does not teach a system for asynchronously transmitting one or more incremental database updates from a primary site to a remote site, the primary site and the remote site interconnected by at least one communication link; and performing a second point in time virtual copy of the modified data of the third volume to a fourth volume, which is at the remote site.

Beal et al. teaches a system and method for enabling pair-pair remote copy storage volumes to mirror data in another pair of storage volumes (See abstract), in which he teaches a system for asynchronously transmitting one or more incremental database updates from a primary site to a remote site, the primary site and the remote site interconnected by at least one communication link (See abstract, column 2, lines 53-67; column 3, lines 1-14); performing a second point in time virtual copy of the modified data of the third volume to a fourth volume, which is at the remote site (See abstract; column 3, lines 27-33).

Therefore, it would have been obvious to a person having ordinary skill in the art at the time of the invention was made to have modified Milillo et al., to include a system for asynchronously transmitting one or more incremental database updates from a primary site to a remote site, the primary site and the

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remote site interconnected by at least one communication link; and performing a second point in time virtual copy of the modified data of the third volume to a fourth volume, which is at the remote site.

It would have been obvious to a person having ordinary skill in the art at the time the invention was made to have modified Milillo et al., by the teachings of Beal et al. because a system for asynchronously transmitting one or more incremental database updates from a primary site to a remote site, the primary site and the remote site interconnected by at least one communication link; and performing a second point in time virtual copy of the modified data of the third volume to a fourth volume, which is at the remote site would provide an improved method and apparatus for transferring copies of directories of a PPRC virtual volume pair to a second pair of co-located virtual volumes (See Beal et al., column 3, lines 5-8).

As to claim 36, Milillo et al. teaches (a) destaging modified data to a first volume at the primary site for a current database update and updating one or more bits in a first bitmap at the primary site that indicate one or more tracks on the first volume that are to be overwritten with the modified data, the updating one or more bits being a first point in time virtual copy of the modified data of the first volume to a second volume, wherein the first point in time virtual copy updates the first bitmap without copying the modified data to the second (See column 2, lines 44-67; column 3, lines 1-33; column 8, lines 13-67; column 9, lines 1-5);

(b) transferring the first bitmap to a second bitmap at the primary site for indicating the modified data that is to be transmitted to a third volume at the remote site for the current database update (See column 4, lines 47-60; column 8, lines 42-60); and

(c) synchronizing the second volume at the primary site with the third volume at the remote site for the current database update by transmitting the modified data from either the first volume or the second volume depending on bit setting in the first bit map to the third volume as indicated by the one or more bits in the second bitmap (See column 2, lines 43-67; column 4, lines 47-60).

Milillo et al. does not teach a program storage device, tangibly embodying a program of instructions executable by a machine to perform a method for asynchronously transmitting one or more incremental database updates from a primary site to a remote site, the primary site and the remote site interconnected by at least one communication link (See abstract, column 2, lines 53-67; column 3, lines 1-14); and (d) performing a second point in time virtual copy of the modified data of the third volume to a fourth volume, which is at the remote site (See abstract; column 3, lines 27-33).

Beal et al. teaches a system and method for enabling pair-pair remote copy storage volumes to mirror data in another pair of storage volumes (See abstract), in which he teaches a program storage device, tangibly embodying a program of instructions executable by a machine to perform a method for asynchronously transmitting one or more incremental database updates from a primary site to a remote site, the primary site and the remote site interconnected

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by at least one communication link (See abstract, column 2, lines 53-67; column 3, lines 1-14); and (d) performing a second point in time virtual copy of the modified data of the third volume to a fourth volume, which is at the remote site (See abstract; column 3, lines 27-33).

Therefore, it would have been obvious to a person having ordinary skill in the art at the time of the invention was made to have modified Milillo et al., to include a program storage device, tangibly embodying a program of instructions executable by a machine to perform a method for asynchronously transmitting one or more incremental database updates from a primary site to a remote site, the primary site and the remote site interconnected by at least one communication link; and (d) performing a second point in time virtual copy of the modified data of the third volume to a fourth volume, which is at the remote site.

It would have been obvious to a person having ordinary skill in the art at the time the invention was made to have modified Milillo et al., by the teachings of Beal et al. because a program storage device, tangibly embodying a program of instructions executable by a machine to perform a method for asynchronously transmitting one or more incremental database updates from a primary site to a remote site, the primary site and the remote site interconnected by at least one communication link; and (d) performing a second point in time virtual copy of the modified data of the third volume to a fourth volume, which is at the remote site would provide an improved method and apparatus for transferring copies of directories of a PPRC virtual volume pair to a second pair of co-located virtual volumes (See Beal et al., column 3, lines 5-8).



As to claims 53-55, Milillo et al., as modified, teaches wherein during the synchronizing, the first volume is accessible to a host at the primary site, and the four volume is accessible to a host at the remote site (See Beal et al., abstract; column 3, lines 27-33; also see Milillo et al., column 1, lines 56-67; column 2, lines 1-6).

As to claim 56, Milillo et al., teaches a method for backing up data from a primary site to a remote site (See column 2, lines 31-42) comprising;

(a) destaging modified data to a first volume at the primary site for a current database update (See column 2, lines 44-53, lines 58-67);

(b) performing a first point in volume virtual copy of the modified data of the first volume to a second volume at the primary site by setting a first bitmap without copying the modified data to the second volume (See column 2, lines 44-67; column 3, lines 1-33; column 8, lines 13-67; column 9, lines 1-5);

(c) synchronizing the second volume with a third volume at the remote site by transmitting the modified data from either the first or the second volume depending on bit setting in the first bitmap to the third volume (See column 2, lines 43-67; column 4, lines 47-60).

Milillo et al. does not teach a program storage device, tangibly embodying a program of instructions executable by a machine to perform a method for asynchronously transmitting one or more incremental database updates from a primary site to a remote site, the primary site and the remote site interconnected

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by at least one communication link; and (d) after completion of the synchronizing, performing a second point in time virtual copy of the modified data of the third volume to a fourth volume at the remote site.

Beal et al. teaches a system and method for enabling pair-pair remote copy storage volumes to mirror data in another pair of storage volumes (See abstract), in which he teaches a program storage device, tangibly embodying a program of instructions executable by a machine to perform a method for asynchronously transmitting one or more incremental database updates from a primary site to a remote site, the primary site and the remote site interconnected by at least one communication link (See abstract, column 2, lines 53-67; column 3, lines 1-14); (d) after completion of the synchronizing, performing a second point in time virtual copy of the modified data of the third volume to a fourth volume at the remote site (See abstract; column 3, lines 27-33).

Therefore, it would have been obvious to a person having ordinary skill in the art at the time of the invention was made to have modified Milillo et al., to include a program storage device, tangibly embodying a program of instructions executable by a machine to perform a method for asynchronously transmitting one or more incremental database updates from a primary site to a remote site, the primary site and the remote site interconnected by at least one communication link; (d) after completion of the synchronizing, performing a second point in time virtual copy of the modified data of the third volume to a fourth volume at the remote site.

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It would have been obvious to a person having ordinary skill in the art at the time the invention was made to have modified Milillo et al., by the teachings of Beal et al. because a program storage device, tangibly embodying a program of instructions executable by a machine to perform a method for asynchronously transmitting one or more incremental database updates from a primary site to a remote site, the primary site and the remote site interconnected by at least one communication link; (d) after completion of the synchronizing, performing a second point in time virtual copy of the modified data of the third volume to a fourth volume at the remote site would provide an improved method and apparatus for transferring copies of directories of a PPRC virtual volume pair to a second pair of co-located virtual volumes (See Beal et al., column 3, lines 5-8).

As to claim 58, Milillo et al. as modified, teaches wherein the synchronizing step further includes inspecting the first bitmap to determine whether the modified data is on the first volume or the second volume (See column 2, lines 43-67; column 4, lines 47-60; column 8, lines 29-67).

### ***Claim Rejections - 35 USC § 103***

4. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary

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skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

5. Claims 17, 34 and 52, are rejected under 35 U.S.C. 103(a) as being unpatentable over Milillo et al. (U.S. Patent No. 6,643,671) in view of Beal et al. (U.S. Patent No. 6,253,295), as applied to claims 1-11, 13-16, 18-28, 30-33, 36-46, 48-51 and 53-56 above, and further in view of Crockett et al. (U.S. Patent No. 5,504,861).

As to claims 17, 34 and 52, Milillo et al. as modified, still does not teach wherein the at least one communication link is comprises at least one of a channel link; a T1/T3 link; a Fibre channel; and an ESCON link.

Crockett et al. teaches remote data duplexing (See abstract), in which he teaches wherein the at least one communication link is comprises at least one of a channel link; a T1/T3 link; a Fibre channel; and an ESCON link (See Crockett et al., column 7, lines 6-20).

Therefore, it would have been obvious to a person having ordinary skill in the art at the time of the invention was made to have modified Milillo et al., to include wherein the at least one communication link is comprises at least one of a channel link; a T1/T3 link; a Fibre channel; and an ESCON link.

It would have been obvious to a person having ordinary skill in the art at the time the invention was made to have modified Milillo et al., by the teachings of Crockett et al. because wherein the at least one communication link is comprises at least one of a channel link; a T1/T3 link; a Fibre channel; and an ESCON link would provide a method and apparatus for providing a real time

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update of data consistent with the data at a primary processing location using minimal control data, wherein the method and apparatus operates independently of a particular application data being recovered, that is, generic storage media based rather than specific application data based (See Crockett et al., column 2, lines 49-55).

### ***Response to Arguments***

5. Applicant's arguments filed on 02-July -2008, with respect to the rejected claims 1-11, 3-28, 30-34, 36-46 and 48-58 have been fully considered but they are not found to be persuasive:

The applicant has submitted blanket arguments regarding the prior arts of record and the 102 rejection present by the examiner. Specifically, the applicant only presents an interpretation of what the applicant believes the Milillo reference discloses and what the present application discloses without any real arguments as to how and why they specifically differ or believe they differ. This also applies to the 103 blanket arguments which only refer to the other prior arts of record as not teaching the deficiencies the applicant believes the 102 rejection lacks. The examiner would like to therefore, address the newly amended claim language and how the prior art still reads on it. The new claim language added to the independent claims in order to overcome the prior art (Milillo) of record reads as follows: "the updating one or more bits being a first point in time virtual copy of the modified data of the first volume to a second volume, wherein the first point in time virtual copy updates the first bitmap without copying the modified data to the

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second". This claim language has been added to clarify "first point in time virtual copy". The examiner believes the new claim language is still taught in Milillo because Milillo teaches the source volume receiving a series of write commands from a host and making a snapshot copy by establishing a bitmap with the updated write commands. A copy of the bitmap having the accumulated write commands is received by primary target volume from source volume. The Bitmap is then reset (updated) at the source volume in order to identify the next set of accumulated write commands (See column 8, lines 13-67). Examiner believes this teaches updating the first bitmap as argued by the applicant. Furthermore, the negative limitation "without copying" can not be found in the Specification. Any negative limitation or exclusionary proviso must have basis in the original disclosure. If alternative elements are positively recited in the specification, they may be explicitly excluded in the claims. See *In re Johnson*, 558 F.2d 1008, 1019, 194 USPQ 187, 196 (CCPA 1977) ("[the] specification, having described the whole, necessarily described the part remaining."). See also *Ex parte Grasselli*, 231 USPQ 393 (Bd. App. 1983), *aff'd mem.*, 738 F.2d 453 (Fed. Cir. 1984). The mere absence of a positive recitation is not basis for an exclusion (See MPEP 2173.05 (i)).

### ***Conclusion***

6. Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**.

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See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.

7. Any inquiry concerning this communication or earlier communications from the examiner should be directed to MELLISSA M. CHOJNACKI whose telephone number is (571)272-4076. The examiner can normally be reached on 9:00am-5:30pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Charles Rones can be reached on (571) 272-4085. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

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October 27, 2008  
MMC

/Charles Rones/  
Supervisory Patent Examiner, Art Unit 2164